

Preserving Lighthouses

Candace Clifford

Moving Lighthouses

Seven Foot Knoll Lighthouse, Baltimore, Maryland. Photo courtesy JCC/NPS.

In recent weeks much media coverage has been devoted to the relocation of the Cape Hatteras Light Station away from the eroding shoreline. The 199-foot-tall brick tower, along with the station's oil house and two keepers' dwellings have been moved 2,900 feet to place them 1,600 feet from the shoreline. In the new location, they have approximately the same orientation with the sea as when the tower was completed in 1870. Although many lighthouses have been moved, this is the most spectacular lighthouse relocation ever attempted.

The tallest lighthouse in the United States, Cape Hatteras has a granite foundation supporting a conical tower made from one-and-a-quarter million bricks. Originally 1,500 feet from the shoreline, the tower stood 300 feet from the ocean in 1919; the Bureau of Lighthouses installed 900 feet of "interlocking sheetpile groins" in 1930. Because the groins proved inadequate, the Lighthouse Service moved the light in 1935 from the 1870 tower to a 150-foot-tall skeletal tower located one mile to the northwest. In the late 1930s, erosion control efforts by the Civilian Conservation Corps and the National Park Service arrested the erosion and the beach began to accrete. The light was returned to the 1870 tower in 1950. After a destructive 1955 hurricane, the park built up the beach with sand. In the 1960s more sand was pumped onto the beach and sandbags placed in front of the tower. Three reinforced concrete groins were constructed in 1969. More beach nourishment was conducted in the 1970s. In 1974, the North Carolina's Coastal Area Management Act discouraged efforts to further harden or artificially stabilize retreating shorelines. The 1980s saw an experiment with artificial seaweed planted to stabilize the sand just offshore, more sandbags, and the extension and stabilization of the groin nearest the lighthouse.

In 1988, a study by the National Academy of Sciences and a subsequent update by the



University of North Carolina in 1997 reviewed various options for saving the lighthouse and concluded the most effective option was to move it. In recent decades, moving heavy structures had become easier with the development of a unified jacking system which can push large loads uniformly with a 30,000th of an inch accuracy. Within the last five years, three lighthouses along the New England coast—Block Island Southeast, Cape Cod (Highland), and Nauset Beach, have been moved using this technology. In the case of Cape Hatteras, Joe Jakubik of International Chimney, one of the contractors for the move, stated that the biggest concern of the project was the potential of a destructive storm. Many precautions were taken to help alleviate this risk. The move mat (steel beams supporting the tracks) was placed below ground level so that in a storm sand would tend to wash into the site rather than out, lessening the vulnerability. The contractors also had the ability to lower and lock the hydraulic jacks and infill with oak cribbing so that the tower could rest on a solid foundation if a bad storm was predicted.

Before the move, material sampling and testing allowed them to determine the stresses that the lighthouse could endure; geotechnical testing was also performed on the ground along the move route. Once the limits of the materials and ground were known, adequate support bracing and soil improvements were designed and implemented so as not to approach those limits. In addition, it was determined that the move

Drum Point lighthouse at the Calvert Marine Museum, Solomons, Maryland. NPS photo.

would not jeopardize the property's listing in the National Register of Historic Places.

The greatest challenge of moving the 4,800-ton Cape Hatteras Lighthouse from the perspective of Bob Woody, Chief of Planning and Partnership at Cape Hatteras National Seashore, was "overcoming the social, political, and economic issues that surrounded the project—that didn't take but about 18 years! The actual relocation effort, though complex, was not difficult from a technical view...." When asked what advice to pass on to others considering a lighthouse relocation, Rob Bolling, a historian for the site offered,

Based on sound science, articulate the problem and the rationale behind relocation to constituents, and the momentum will build when funding is the issue. Present the issue fairly and professionally, and know what you are saying when doing so. Be respectful of opposing viewpoints, but gently persuasive. Promptly correct any misinformation from move opponents.

Previous to these recent moves of masonry towers, most lighthouses that have been moved have been made of either wood or cast-iron plate. In fact, the cast-iron-plate towers were designed with the idea that they might be potentially dismantled, moved, and reassembled at a new location. Examples of cast-iron towers being moved include the 1852 Matagorda Island Lighthouse, Texas, moved in 1873; the 1875 Hunting Island

Cape Canaveral Lighthouse and oil house. NPS photo.



Lighthouse, South Carolina, moved in 1889, the 144-foot-tall 1868 Cape Canaveral Light, Florida, moved in 1894. The latter two were moved to avoid erosion.

The Lighthouse Establishment often moved a lighthouse to serve an entirely different station. The 1820 brick tower first constructed on Great Cumberland Island, Georgia, was relocated in 1838 to serve Amelia Island at the entrance to St. Mary's River, Florida. The 1824 granite tower on Goat Island in Newport Harbor, Rhode Island, was relocated in 1851 to serve the east side of Sandy Point in Narragansett Bay. An example of a tower moved to better serve its current station, the 1893 cast-iron Chicago Harbor Light on Lake Michigan was moved to a new breakwater in 1919.

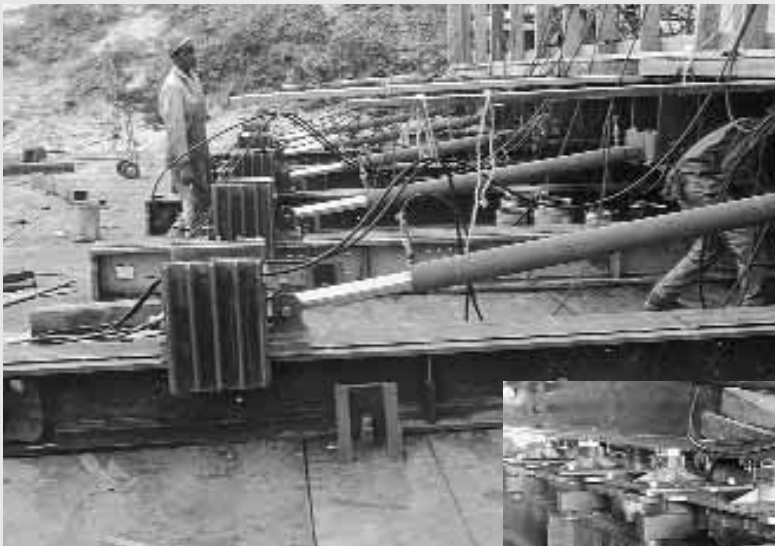
Although eroding shorelines seem to be the primary motivation for moving a lighthouse, many light stations have been moved to ensure their preservation after their careers as active aids to navigation have ceased. Drum Point Light Station marking the entrance to the Patuxent River on the Chesapeake Bay in Maryland, was replaced in 1962 by a nearby modern light on steel piles. To preserve the superstructure, the Calvert Marine Museum moved it ashore in 1975

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NPS photo.

Moving Cape Hatteras Lighthouse



*Left, hydraulic push jacks.
Below, beneath the light,
Hilman rollers on hydraulic
jacks.*





Above, the rail and steel mat are constantly moved forward. Right, the lighthouse about 600 feet from its original site.



View of the move path of the Cape Hatteras Lighthouse.



**Photos by Mike Booher,
unless otherwise noted.**

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to its grounds in Solomons, Maryland. As a moved property, it was initially taken off the National Register of Historic Places and relisted after its successful restoration in accordance with the Secretary of the Interior's Standards. The station is interpreted and accessible to the public at its new location. Other screwpile structures relocated ashore include the 1855 Seven Foot Knoll, Maryland, moved in 1987 to Pier 5 on Baltimore's Inner Harbor; the 1879 Hooper Strait, Maryland, moved in 1967 to the Chesapeake Bay Maritime Museum in St. Michaels; Half Moon Reef, Texas, moved in 1980 to the Port Lavaca Community Park; and the Roanoke River, North Carolina, moved in 1955 to Edenton, North Carolina. The latter serves as a private residence. Several other towers were moved after they were purchased by private owners, including Southampton Shoals Light Station, California, which became a yacht club and Oakland Harbor Light Station, California, now a restaurant.

Cape Hatteras Light will be re-lit in a special ceremony. The navigational light is currently

created by a DCB-24 installed in 1972; the park is actively searching for a first-order Fresnel lens to replace this modern optic. The Seashore plans to reopen the tower to visitors around Memorial Day. As part of the overall preservation plan, the light station will be interpreted to its 1890s period. Saving the tower from the eroding shoreline was a crucial phase in its preservation. The successful move to its new location assures that millions of visitors will continue to enjoy this National Historic Landmark.

Candace Clifford is a consultant to the National Conference of State Historic Preservation Officers, working with the National Maritime Initiative of the National Park Service.

For more information on the Cape Hatteras Light Station relocation project, visit <<http://www.nps.gov/caha/lrp.htm>>.

For more on lighthouses in general, visit the National Maritime Initiative's Lighthouse Heritage web site <http://www.cr.nps.gov/maritime/lt_index.htm>.

Michelle C. Saxman

The Canton Asylum for Insane Indians

The South Dakota State Historical Society/State Historic Preservation Office (SHPO) was contacted by Harold Iron Shield concerning the protection of the Canton Asylum cemetery. He requested that a National Register nomination be prepared for the cemetery so it would have some protection, as it is located on the Municipal Golf Course. He was concerned that golfers were playing through the cemetery. We suggested that Mr. Iron Shield contact the owner of the property, the city of Canton, to resolve this issue. He informed us that his appeals to the City of Canton were unheeded. We informed him that it is not easy to list a cemetery on the National Register of Historic Places unless it was associated with an important historical event. We also informed him that listing on National Register would not stop people from

golfing on the property, although it might provide some recognition of the cemetery.

The City of Canton was contacted to inquire if they would object to the listing of the cemetery. The city supported nominating the cemetery. At the beginning of the research process, the SHPO discovered that there was very little information concerning the Canton Asylum. We had to rely on several secondary resources to write the nomination. The SHPO survey form noted that information could be found at the South Dakota State Archives. Reviewing the articles in the archives, we discovered that the cemetery was the only remaining site associated with the Asylum. A nomination was prepared, and the cemetery was placed on the National Register of Historic Places in February 1998.

The Canton Asylum for Insane Indians was established by Congress in 1899 and the Indian